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Foreword

Symbol Conventions

The manual quotes the safety symbols, these symbols used to prompt users to comply with safety matters during installation, operation and maintenance. Safety symbol meaning as follows.

Symbol	Description
	Alerts you to a high risk hazard that will, if not avoided, result in serious injury or death.
	Alerts you to a medium low risk hazard that could, if not avoided, result in moderate or minor injury.
	Alerts you to a low risk hazard that could, if not avoided, result in minor injury.
	Anti-static prompting.
	Be care electric shock prompting.
	Provides a tip that may help you solve a problem or save time.
	Provides additional information to emphasize or supplement important points in the main text.

Contents

1 Safety Description

This chapter mainly describes the safety announcements. Prior to performing any work on the device, please read the user manual carefully, follow the operation and installation instructions and observe all danger, warning and safety information, which is to avoid human injury and device damage by irregular operations.

1.1 Safety Announcements

This section mainly describes the safety announcements when operation and maintenance. For details, please refer to safety description in the relevant chapters.

CAUTION

Before using UPS, please read the announcements and operation instructions in this section carefully to avoid accident.

The promptings in the user manual, such as "Danger", "Warning", "Caution", etc. don't include all safety announcements. They are just only the supplement of safety announcements when using UPS.

NOTE

Any device damage caused by violating the general safety operation requirements or safety standards of design, production, and usage will be out of warranty range.

1.1.1 Use Announcements

DANGER

There exists high temperature and high voltage inside UPS. When using UPS, please strictly comply with all warnings and operation instruments on the UPS and in the user manual.

CAUTION

Only authorized professionals are allowed to open the UPS chassis to avoid electric shock. Otherwise, if it causes UPS failure, it is out of the guarantee range.

CAUTION

UPS is a class A product. When it is applied to residential building, additional measures should be took to prevent harassment.

- Ensure that no liquid or other foreign objects can enter into UPS.
- UPS must be grounded well.
- If UPS has to be moved, rewired or maintained, it must disconnect all electrical connection, such as AC power, battery power, etc. to isolate power. It can't perform any work on the UPS until UPS is powered off completely (≥10min). Otherwise, the output may have electricity, which may cause electric shock.
- When dismantling fan, do not put fingers or tools into the rotating

fan until it has stopped working to avoid device damage or human injury.

- In case of fire, use dry powder extinguisher to put out the fire. If you use liquid fire extinguisher, it may cause electric shock.

1.1.2 Battery Announcements

Please use specified model battery! Non-specified model battery will lead to UPS damage.

- Only authorized professional can replace battery. When operation, take off conductive objects, such as watch, bracelet, bangle, ring, etc., wear rubber shoes and gloves and use tools with insulated handle. Don't put tools or other conductive objects on the battery.
- It's prohibited to connect the anode of battery with the cathode of battery or connect them reversely, which is to avoid fire or electric shock.
- Before connecting or disconnecting the battery terminals, disconnect charger first.
- The battery must be with the same type, model, and manufacturer.

- Battery should be kept away from fire source or all electrical equipments that may easily cause spark avoid human injury.
- Don't open or destroy battery. The electrolyte in the battery includes some dangerous objects, such as strong acid, which will be harmful to skin and eyes. If it is careless to touch the electrolyte, clean it by a lot of water immediately and then check it in the hospital.
- The waste battery should be disposed according to the local regulations.

1.1.3 ESD Protection

⚠ CAUTION

To prevent human electrostatic damaging sensitive components (such as circuit board), make sure that to wear a anti-static wrist strap before touching sensitive components, and the other end of wrist strap is well grounded.

2 Overview

This chapter mainly describes the model meaning, features, structure and working principle, etc.

2.1 Product Intro

UPS 10K are with all high frequency, pure online, double-conversion, intelligent features. They are the perfect power

security for file server, enterprise server, center server, mirco-computer, concentrator, telecom system, data center, medical device and others that require high quality power protection. They are widely applied to the many key business areas, such as post, finance, network, stock, railway, medical, etc.

UPS 10K are with the single-phase AC input and single-phase AC output.

2.1.1 Features

Intelligent RS232 communication

Through the RS232 standard data port and UPS power management software, it can realize the three remote function between the computer and UPS, monitor the running and electrical data of UPS on the computer, perform ON/OFF operation remotely and support SNMP network adaptor (external, connect with UPS through RS232 port), which makes UPS be a network new member.

High input power factor

Adopt the advanced active PFC technology, which eases load in the power grid. It is the new generation green power.

High cost performance

Adopt many kinds of power conversations and high frequency PWM technologies, which is with high efficiency, small volume, light weight, improves the running reliability and reduces cost.

Perfect protection

Equipped with the functions, such as output over-voltage protection, battery under-voltage protection, input over-voltage protection, triple over-current protection, etc. and solve the problems of the high frequency UPS, such as poor adaptability in the power grid and weak anti-impact ability.

Low mains input voltage

Adopt the independent rapid detection technology. When the mains input voltage is 120V, which is the lower limit, the battery still doesn't discharge. Therefore, in the mains mode, all output power gets from the power grid, which is to ensure the battery is still in the 100% energy storage status, reduce the battery discharge times and prolong the working life.

2.2 Appearance

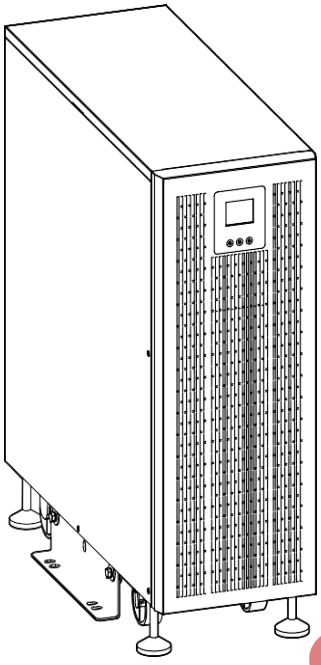


Figure2-1 Appearance

2.2.1 Operation Panel

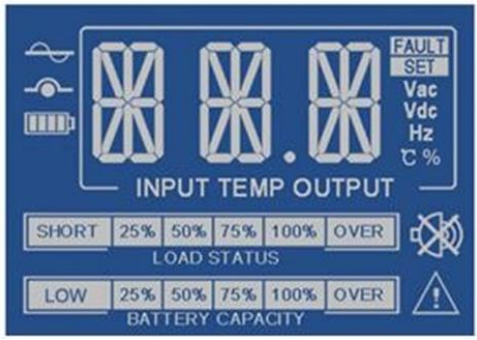


Figure2-2 The main page

Table2-1 The illustration of touch screen

Icon	Description
	Mains icon ON: Mains input is normal.
	Bypass icon ON: UPS works in the bypass mode.
	Battery icon: four energy bars 1. When the energy bars light on from left to right again and again, it indicates battery is in charge. 2. When all energy bars are on, it indicates battery is fully charged. 3. When all energy bars flicker, it indicates battery is over-voltage. When all energy bars are off and the frame flickers, it indicates battery is about to run out.
	Silence icon ON: Buzzer is in the silence status.
	Alarm icon ON:UPS fails
	Icons: They indicate the value of Voltage, Frequency, Temperature, Load.

2.2.2 Rear Panel View

Standard model

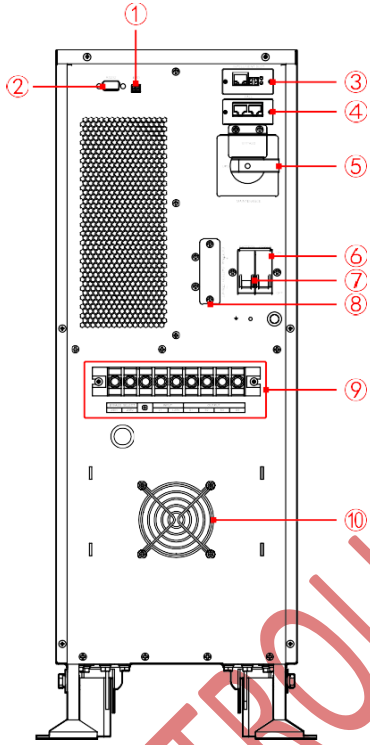


Figure2-3 Rear panel of standard model

Table2-2 UPS terminals illustration

No.	Silk screen	Illustration
1	EPO	EPO connector
2	RS232	RS232 communication port
3	INTELLIGENT SLOT	Intelligent slot (optional), supporting communication cards include: ● Dry-contact Kit (Y3) NT-RS485Y3 ● USB Kit NT-USB ● Protocol Transfer Kit NT-MODBUS ● SNMP Card
4	PALL	In parallel (optional)
5	MAINTENANCE BYPASS	Maintenance bypass switch (optional)
6	POWER	Mains breaker
7	BATTERY	Battery breaker
8	EXTERNAL BATTERY CABINET	Battery expansion port
9	-	Input terminals, output terminals
10	-	Fan

2.2.3 RS232 Communication

The corresponding pin relationship between RS232 port of UPS and RS232 port of PC is as shown in Table2-3.

Table2-3 The corresponding pin relationship between RS232 port of UPS and RS232 port of PC

RS232 port of UPS	RS232 port of PC
9	2 (receiving end)
6	3 (transmitting end)
7	5 (grounding end)

2.2.4 EPO Connector

When connecting two ports in the EPO connector together, UPS will close output. If it needs to recover output, disconnect two ports in the EPO connector and power UPS off, and then restart UPS.

2.2.5 Intelligent Slot

The UPS series can install different intelligent communication cards in INTELLIGENT SLOT position to realize different communication methods. Supporting communication cards include Dry-contact Kit (Y3) NT-RS485Y3, USB Kit NT-USB, Protocol Transfer Kit NT-MODBUS and SNMP Card. The detail installation and use method of intelligent communication cards please refer to corresponding install guide.

2.2.6 Parallel Port

If the device is in parallel, install Parallel Kit-T (2m) NT-PA in the parallel port and connect the UPS through parallel communication wire. The parallel UPS wiring please see 3.4.3 Wiring of Parallel System and the instructions for use please see 4.4 Parallel System Operation.

2.3 Working Principles

When the mains is normal, the input of UPS 10K converts into the ±380V steady DC voltage through PFC, which supplies power for DC/AC inverter to output steady 240V AC and charges battery at the same time. When the mains is abnormal, the battery will boost into the ±380V DC voltage for DC/AC inverter through DC/DC.

The working principles of UPS 10K is as shown in Figure2-4.

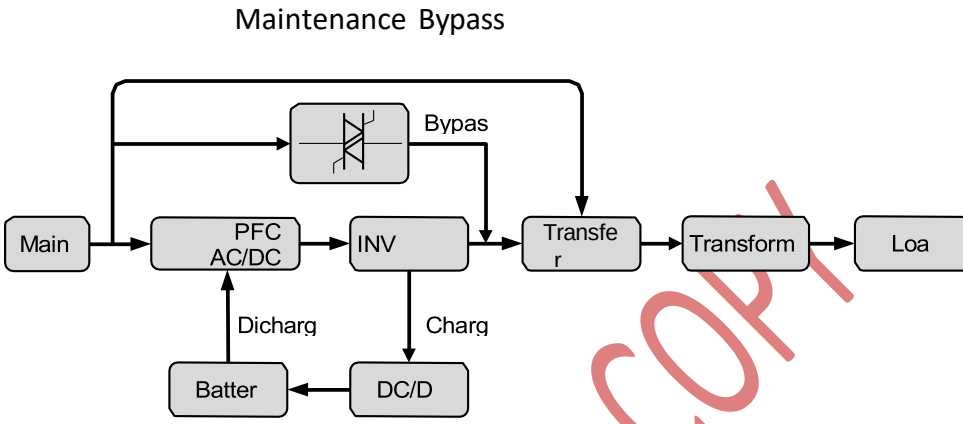


Figure2-4 Working principle

2.4 Working Mode

There are 4 work modes of the UPS: normal mains power supply mode, battery inverter mode, bypass power supply mode and maintenance bypass power supply mode.

2.4.1 Normal Mains Power Supply Mode

When mains power is normal, the UPS works in mains inverter status and charge the battery at the same time.

2.4.2 Battery Inverter Mode

When mains is abnormal, the rectifier will transfer to battery input immediately, boost the battery voltage and then maintain the voltage of DC bus voltage to guarantee the inverter output

continuous. Before the battery stop discharging, if the mains recover normal, the rectifier will transfer to mains input automatically and charge the battery at the same time. That is to say, the UPS recover normal mains power supply mode. If the mains always abnormal and the battery is running up, the UPS will send sound alarm and stop working till battery low-voltage point. At that time, the buzzer long beeps to alarm, the power for load powers down. Under the circumstance of mains power outage completely, the UPS will shut down about 40S later automatically and close the power of the UPS to avoid the battery discharge slimly, thus to protect the service life of battery. Once the mains recover, the UPS will start automatically and turn to normal mains power supply mode.

2.4.3 Bypass Mode

Under the circumstance of bypass voltage is normal, when UPS off or fault (such as inverter output overload, over-current surge or IGBT over-temperature etc.) while UPS on, the UPS will output by bypass. When UPS on and the fault removed, it will turn to inverter output again.

2.4.4 Maintenance Bypass Mode

NOTE

Only for UPS with maintenance bypass.

When it needs to maintain UPS or replace battery, but it can't stop supplying power for load, switch off UPS and transfer to bypass mode, dismantle the maintenance bypass cover and transfer the maintenance bypass switch from maintenance bypass to bypass and then switch off mains breaker and in the rear panel of UPS. Now, AC power draws through maintenance bypass switch to supply power for load.

When UPS needs to be restored after finishing the maintenance, remove the load, switch off the external input breaker, and maintenance switch should be switched to the UPS gear after the device is powered off, and lock back the cover plate of maintenance bypass. Finally, restore UPS mains power supply and start work.

CAUTION

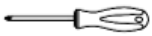
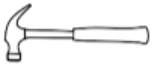
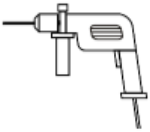
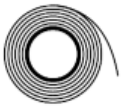
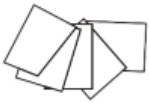
In the maintenance bypass mode, there still exists electricity in the input terminals, output terminals, and the terminals in the filter board.

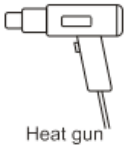
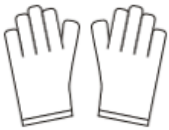
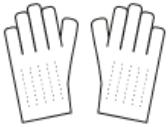
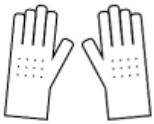
3 Installation

This chapter mainly describes installation preparation, unpacking and checking, electrical connection, etc.

3.1 Installation Preparation

3.1.1 Installation Tools

Tools			
 Clamp meter	 Multi-meter	 Label paper	 Phillips screwdriver
 Flat-headscrewdriver	 Socket wrench	 Adjustable wrench	 Torque wrench
 COAX crimping tool	 Diagonal pliers	 Wire stripper	 Claw hammer
 Hammer drill	 Insulation tape	 Cotton cloth	 Brush

Tools			
 Heat shrink tubing	 Heat gun	 Electrician's knife	 Protective gloves
 ESD gloves	 Insulated gloves	 Hydraulic pliers	 Cable tie

CAUTION

The installation tools must be with insulation protection to avoid electric shock.

3.1.2 Installation Environment

- Don't install UPS where it would be exposed to direct sunlight, in rain or in moist environments.
- Don't install UPS where it is with conductive metal dust or nearby heater.
- Generally, the working temperature is -5℃~+40℃ and the relative humidity is 0%RH~95%RH that is with no condensation (the recommended working temperature is 20℃~25℃ and the recommended relative humidity is about 50%).
- Keep good ventilation around UPS. Poor ventilation will rise temperature inside UPS, which will reduce the working life of inner components and then affect the working life of UPS.
- The recommended altitude is lower than 1000m. If exceeding 1000m, it need to decrease the rated power according to IEC

62040-3-2021.

3.1.3 Installation Way

Put UPS in the flat floor without vibration and the vertical gradient is less than 5°.

3.1.4 Installation Clearance

The clearance between the rear or the side of UPS and adjacent devices or wall should be at least 300mm~500mm.

3.1.5 Input Breaker Selection

Add a breaker (it's recommended that the breaker is with feedback protection and bipolar disconnection function) or a power distribution box in the input wire of UPS, which matches with the power of UPS, to isolate the mains. Consider the charging power of UPS and the transient current impact when power on, the current of the selected breaker should be 1.5~2 times of the max. input current of UPS. Besides, the selected breaker should be without the power leakage protection to avoid mis-operation. The distribution box is better to be made by the professional company. The selection of input breaker refers to Table3-1.

Table3-1 The recommended input breaker of UPS

Index / Model	AC input (A)		DC input (long backup model) (A)	
	Max. current	Breaker	Max. current	Breaker
10kVA	60	100	60	100

3.1.6 Wire Specification

Selection of the cross-sectional area of wire

For the selection of the cross-sectional area of AC input wire, AC output wire and battery wire of UPS, please refer to Table3-2 for the corresponding recommended value and choose upwards.

Table3-2 Wire specifications

Type		10kVA
AC input (neutral/live)	Rated current (A)	45.8
	Cross-sectional area of wire (mm^2)	10
AC output (neutral/live)	Rated current (A)	41.7
	Cross-sectional area of wire (mm^2)	10
DC input (long backup model)	Rated current (A)	52.0
	Cross-sectional area of wire (mm^2)	10
Ground	Cross-sectional area of wire (mm^2)	10

Select wiring terminals

Table3-3 Contrast list between wires and wiring terminals

Wire cross-sectional area (unit: mm^2)	Wiring terminal type
6	RV5.5-6
10	RNBS8-6

The wiring terminals recommend type as shown in Figure3-1. If users have additional terminals required, please check dimensions to ensure proper selection according to Table3-4.

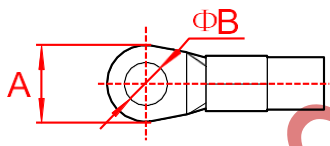


Figure3-1 Dimensions of wiring terminal

Table3-4 Dimensions limit of wiring terminal

Dimensions (unit: mm)	10K
A	≤13
B	≥6

NOTE

The equipped wires by our company are all passed the national

standard or UL certification, the quality is perfect and meets the requirements of safety standard. Under the condition that the length is less than 0.5m, part of the wire is slightly smaller than the recommended specification, it can be used normally.

3.2 Unpacking and Checking

The package of UPS 10K standard model adopts the wooden bracket and carton. The unpacking procedures are as follow.

Step 1 Check the appearance of package for shipping damage. If any shipping damage is found, report it to the carrier immediately.

Step 2 Transport device to the installation site.

⚠ CAUTION

When using a forklift to move UPS, the end of arm of forklift should be beyond the wooden bracket to avoid falling.

Step 3 Cut belts and remove them.

Step 4 Remove the package and take out the optional components and user manual. The appearance after unpacking is as shown in Figure3-2.

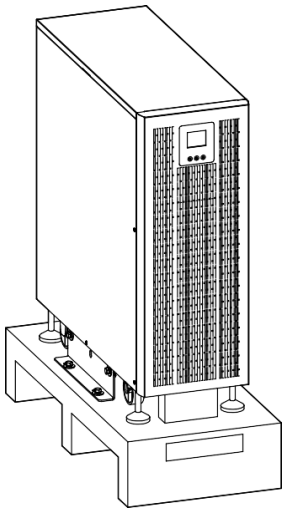


Figure3-2 Appearance after unpacking

Step 5 Check the device completeness.

- Inspect the appearance of device for shipping damage, if any shipping damage is found, report it to the carrier immediately.
- Check if the types of the accessories are complete and correct. If there is any discrepancy, take notes and contact the distributor immediately.

Step 6 If UPS is OK, dismantle four hexagonal bolts M8×80 (two pieces on the left and right side respectively) between the anchor frame and anchor support plate, as shown in Figure3-3.

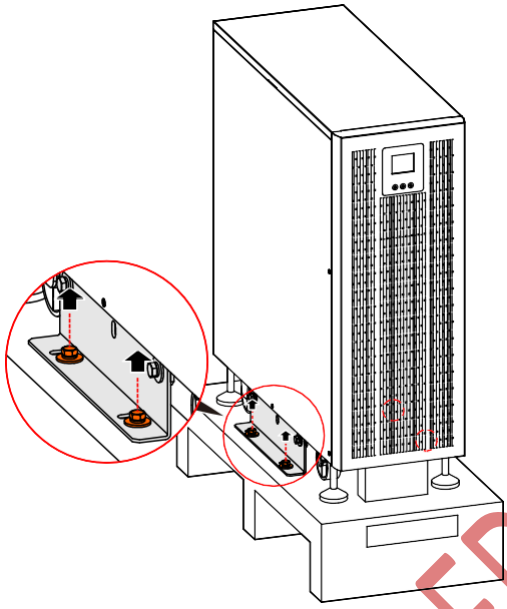


Figure3-3 Dismantle the hexagonal bolts

3.3 Installation

Step 1 Determine and plan the installation position according to the device size, as shown in Figure3-4.

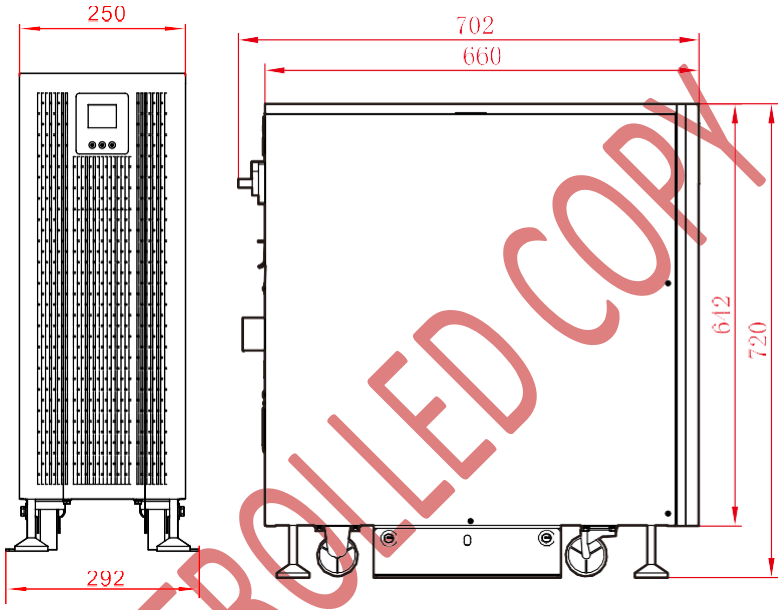


Figure3-4 Outer dimensions of UPS (unit: mm)

Step 2 If there has installation holes in the floor or other bases, fasten UPS in the floor or other bases through anchor, the pedestal installation holes size of each model is as shown in Figure3-5. If the UPS installed on the floor, the structure and installation for the expansion bolt is as shown in Figure3-6.

NOTE

It's recommend to install anchor frame in the anchor support plate by four bolts M8 (drilling deviation±2mm).

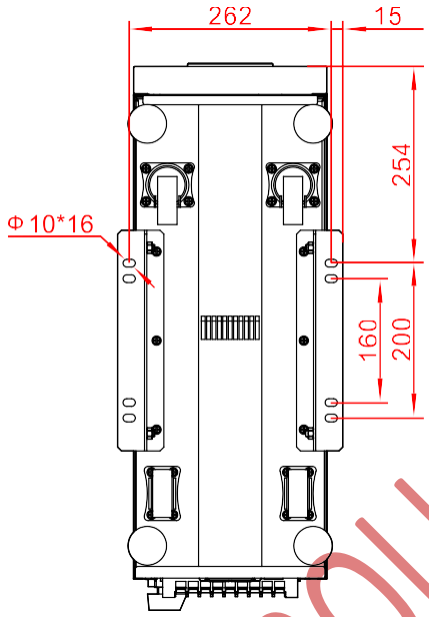


Figure3-5 Installation holes size (unit: mm)

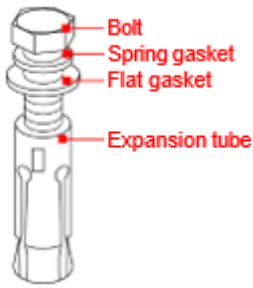


Figure3-6 Expansion bolt structure and installation

1. Drill holes on the installation ground by hammer drill.
2. Tighten the expansion bolts mildly, and put it to the hole vertically, and then knock the expansion bolt by rubber hammer till all the expansion tube into the hole.
3. Pre tighten the expansion bolt.
4. Screw out the bolt , take down the spring gasket and flat gasket.

NOTE

The exposed height of expansion bolt must be within 50mm.

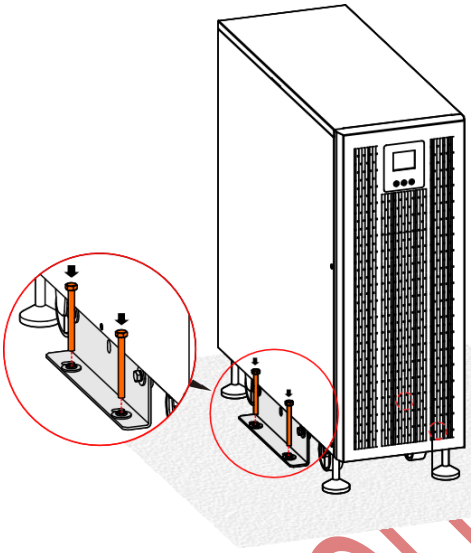


Figure3-7 Install UPS in the installation position

Step 3 Then screw down the supporting feet anticlockwise of the UPS to parallel with ground.

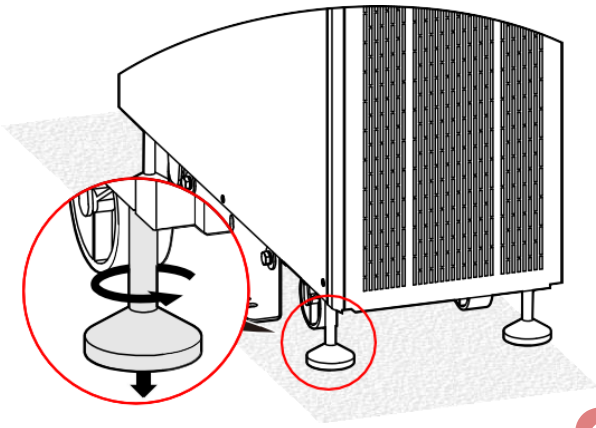


Figure3-8 Screw down the supporting feet brackets

NOTE

After putting UPS in the floor, you can move it by four Omni-directional wheels at the bottom of UPS. When moving UPS, the Omni-directional wheels should be at ON position. After moving UPS, the Omni-directional wheels should be at OFF position to avoid UPS moving.

3.4 Electrical Connection

Before performing the electrical connection, ensure all breakers in the rear panel of UPS, external mains UPStream switch, external battery UPStream switch are all disconnected. It's prohibited to perform wring when power on.

CAUTION

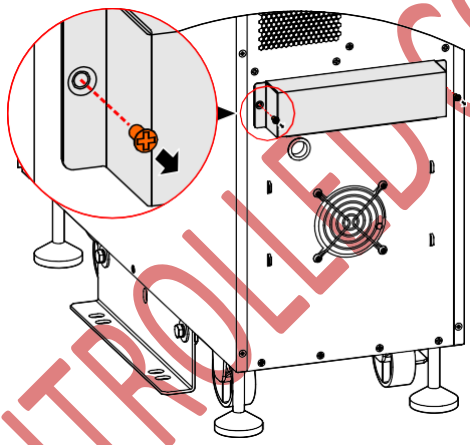
Place wires in such a way that no one can step on or trip over them.

3.4.1 Wiring Operation

In the series UPS, the input and output adopt the terminal bar.

Step 1 Install UPS respectively according to the **3.3 Installation**.

Step 2 Dismantle the wiring cover plate.



Step 3 The wiring diagram of UPS as shown in Figure3-10 and Figure3-11.

CAUTION

1. 120Vac output connection: short circuit for S1-S2, S3-S4, connect S1-S4, then connect BYPASS SELECT to 208V.

2. 208V/220V/230V/240Vac output connection: short circuit

for S2-S3, connect S1 and S4, then connect BYPASS SELECT to 220V.

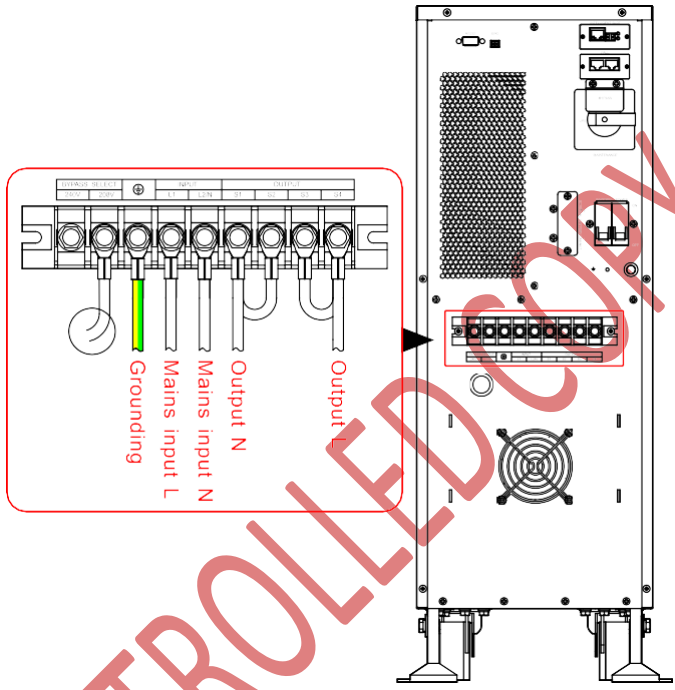


Figure3-10 Wiring diagram of UPS (120Vac)

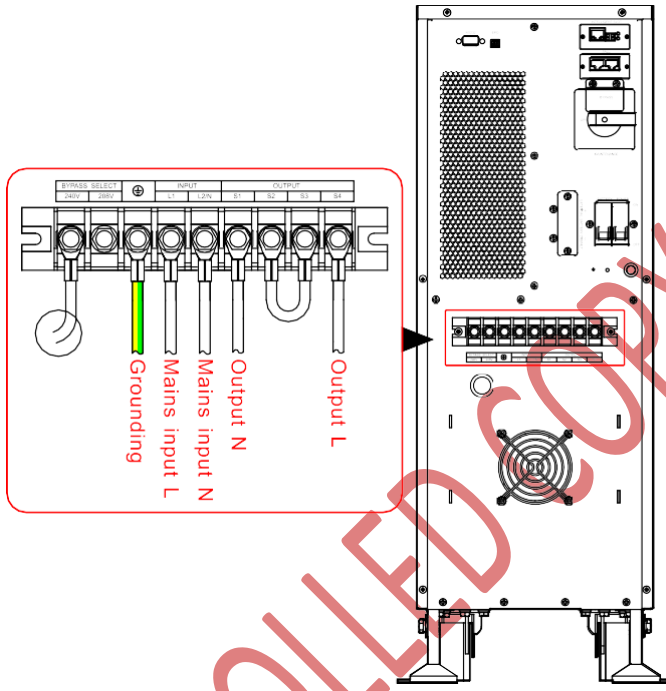
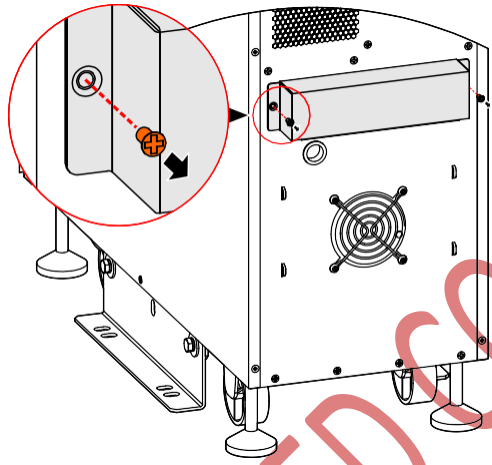


Figure3-11 Wiring diagram of UPS 10K (208Vac/220Vac/230Vac/240Vac)

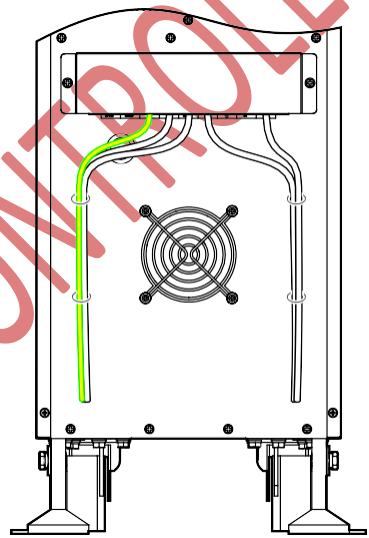
CAUTION

1. UPS wiring must be strictly in accordance with Figure3-10 or Figure3-11 to avoid short circuit.
2. It is necessary to confirm that all wires are connected to the terminal properly and reliably before reinstall the wiring cover plate.

Step 4 After wiring is completed, reinstall the wiring cover plate.



Step 5 Divide the wires into two bundles and fixed to the device through cable tie.



3.4.2 Wiring Between UPS and External Battery

NOTE

Choose whether connect external battery or not according to the actual needs. If not, ignored.

Step 1 Dismantle the sealing plate of external battery port of UPS

Step 2 Plug the extension battery assembly that has been connected with battery into the external battery port, as shown in Figure3-14.

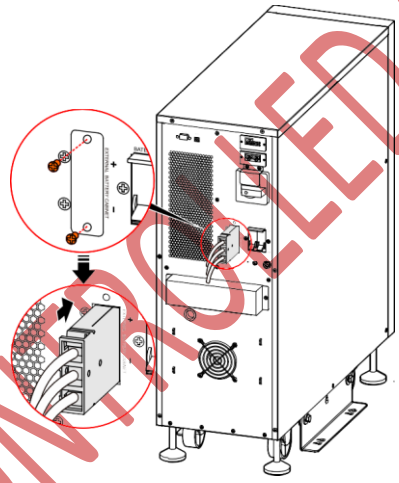


Figure3-14 Extension battery wiring

Step 3 Wiring between UPS and external battery are shown in Figure3-15.

There are 16 cells connect to external battery port, every battery cabinet has one 2P breaker,

the external wiring includes BATT.+ and BATT.- , as shown in Figure3-15.

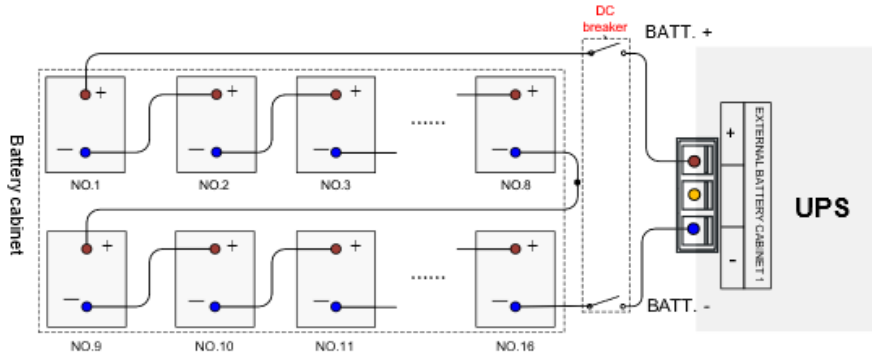


Figure3-15 Wiring diagram

CAUTION

For the device with inner battery, the external battery port is the same voltage as the inner battery. Please make sure that the number of batteries is the same as that of the inner batteries, and then switch on the 2P breaker.

3.4.3 Wiring of Parallel System

Step 1 Install each UPS respectively according to **3.3 Installation**.

Step 2 Connect the AC output of each UPS with the output distribution box, as shown in Figure3-16 and Figure3-17.

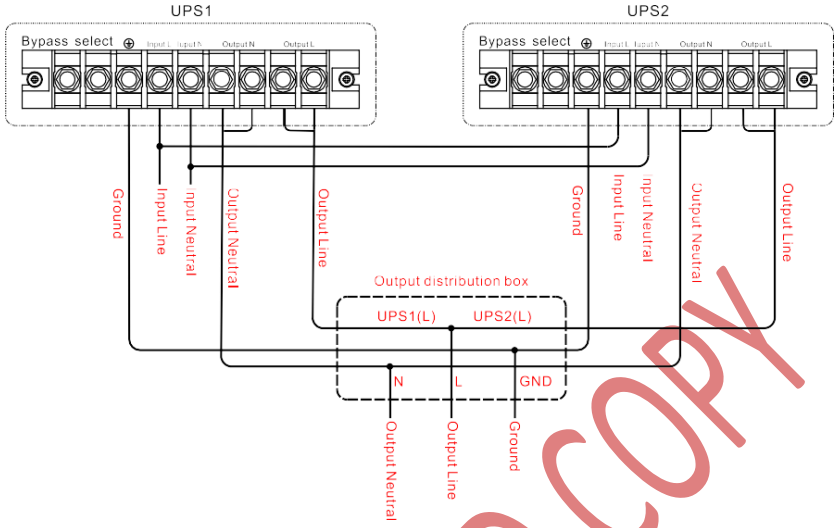


Figure3-16 Wiring diagram of UPS parallel system (120Vac)

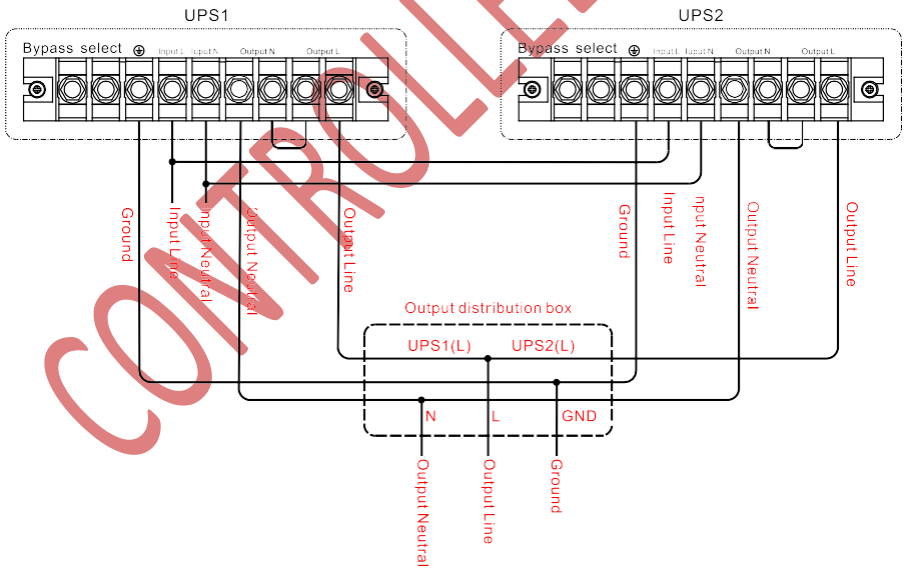


Figure3-17 Wiring diagram of UPS parallel system (208Vac/220Vac/230Vac/240Vac)

Step 3 Connect the equipped parallel wires with parallel port in the rear panel of each UPS in the parallel system.

CAUTION

1. The wiring method and phase sequence of the input of each UPS in the parallel system should be the same. Besides, the bypass power of parallel system should be the in-phase.
2. Each UPS in the parallel system is connected to an independent battery pack. It's prohibited that two UPS use the same battery pack.
3. Connect the equipped parallel wires with parallel port in the rear panel of each UPS in the parallel system. Two RJ45 parallel ports are the same, that will have redundancy to improve reliability. If there has a parallel port disconnected, UPS will have an alarm. After connecting the parallel wires, fasten them in the rear panel holes of each UPS by cable ties.
4. UPS output does not allow on-load startup.

WARNING

1. Ensure the Parallel Kit-T (2m) NT-PA of each UPS is correctly installed in the parallel system (see the installation guide of Parallel Kit-T (2m) NT-PA for details).

2. The wiring and phase sequence of each UPS in the parallel system must be the same strictly, which is to ensure the bypass power of parallel system is the same phase.

3.4.4 Intelligent Slot Installation

The SLOT card installation step are as follows.

NOTE

Take the replacement of SNMP card with Dry-contact Kit (Y3) NT-RS485Y3 as an example.

Step 1 Dismantle standard intelligent slot.

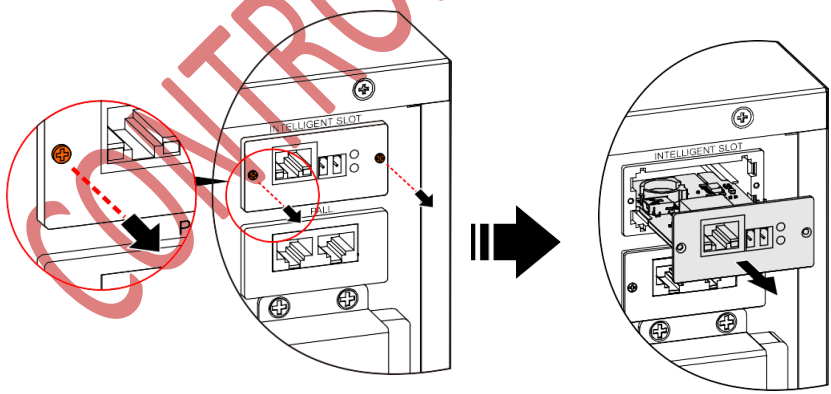


Figure3-18 Dismantle standard intelligent slot

Step 2 Install optional intelligent slot and fix it.

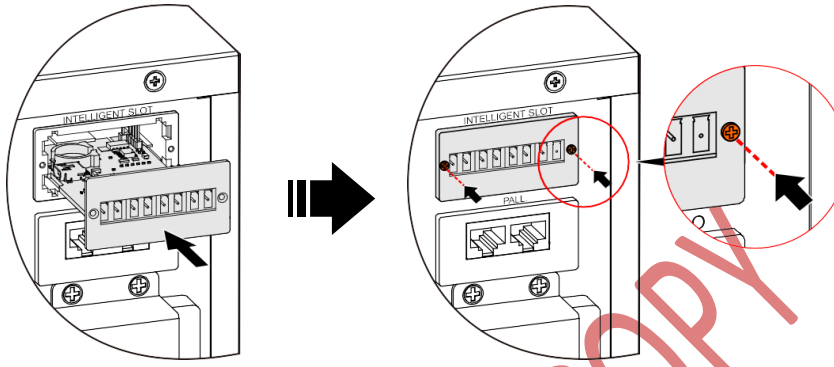


Figure3-19 Install optional intelligent slot

Step 3 Connect communication cable.

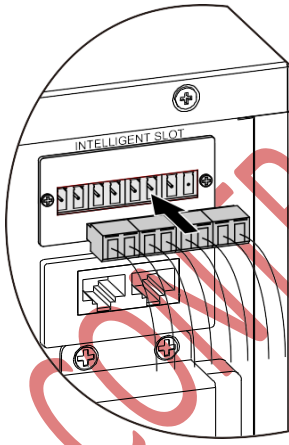


Figure3-20 Connect communication cable

4 Operation and Maintenance

This chapter mainly describes the operation process, operation method, daily maintenance and troubleshooting, etc.

4.1 Check Before Startup

- Check if the wire connection is firm and the color of AC wires is in accordance with the specification.
- Check if UPS is grounded reliably.
- Check if the voltage between the neutral wire and grounding wire is less than 5Vac.
- If installing the remote monitoring device in the UPS, check if the wiring in the RS232 port is correct.
- When connected to external battery, check if the wiring between UPS and battery cabinet is correct and reliable.
- Check if the wiring is neat and the wire binding is in accordance with the specification.
- Check if the installation and wiring are good for transformation, expansion and maintenance in future.
- Check that there is no short-circuit in the output of UPS and the load capacity isn't beyond the rated capacity of UPS.

4.2 Startup Operation

Step 1 Switch on the mains breaker and battery breaker.

Step 2 Press "ON" button on the panel for 1s to start UPS.

Step 3 About 10s later, if the UPS works steadily, start loads, such as PC, etc.

⚠ CAUTION

Start load with the sequence that "high power device→small power device", which is to avoid overload protection when starting high power device.

4.3 Shutdown Operation

Step 1 Close load and keep UPS running without load for about10min to exhaust heat.

Step 2 Press "OFF" button on the panel for 1S.

Step 3 Switch off the battery breaker, and mains breaker.

4.4 Parallel System Operation

4.4.1 Start Parallel System

⚠ CAUTION

Don't start loads until parallel system have started completely. Ensure all breakers in the distribution box are switched off.

Start the parallel system following the procedures as below:

Step 1 After installing parallel system correctly, start each UPS in the parallel system according to **4.2 Startup Operation** successively.

Step 2 When each UPS outputs, measure the inverting voltage of each UPS. The voltage difference between the max. voltage and the min. voltage should be less than 5V. Switch on breakers that connected with each UPS in the distribution box in 5min and check the circulation current of each UPS that should be less than 3A.

If the voltage difference is more than 5V, check if the output of each UPS are consistent with the set output voltage. If the voltage difference is more than 10V, please contact your local distributor or

service center for help. Besides, if the circulation current of each UPS is too large, it will damage inverter. If the circulation current of each UPS is more than 3A, please contact your local distributor or service center for help.

Step 3 Switch on major output breaker and output breakers of each branch in the distribution box. Then start load successively.

4.4.2 Close Parallel System

Generally, it is not recommended that turn on or turn off the parallel system frequently.

Step 1 Close all loads;

Step 2 Press "OFF" button in the panel of each UPS to shut down UPS successively.

Step 3 Switch off breakers in the rear panel of each UPS. (in the daily operation, it's unnecessary to switch them off).

4.4.3 Remove Faulty UPS from Parallel System

When one UPS failure, it will remove from parallel system automatically with sound & light alarm. Now, perform the operations shown in Figure4-1 to remove the faulty UPS from parallel system completely to achieve online hot maintenance or replacement.

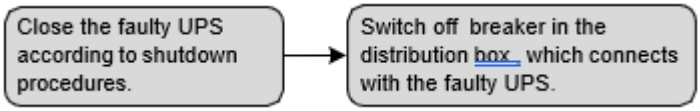


Figure4-1 Remove faulty UPS from parallel system

CAUTION

When the parallel system works normally, don't remove UPS from the parallel system until it's switched off, or the power system will

work abnormally.

4.4.4 Add New UPS into Parallel System

When it has to add one or more UPS into parallel system, perform the operations shown in Figure4-2. When the added UPS works steadily, it will add into parallel system automatically for share current.

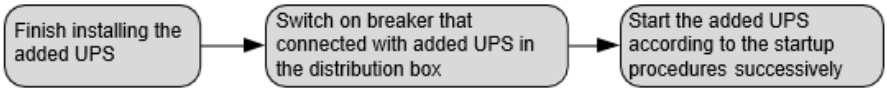


Figure4-2 Add new UPS into parallel system

4.4.5 Redundancy Funciton of Parallel System

When adopting the N+1 redundancy backup design, the total output load should be less than N times of rated load of single UPS. If there has a faulty UPS, it will remove form parallel system automatically, which doesn't influence system running and enhances system reliability. When the output load is more than N times of rated load of single UPS, the overload unit (more than N/(N+1) times of rated load of single UPS) will have an alarm. e.g. For the parallel system with two UPS, when the load of UPS is more than 50%, it will have overload alarm.

4.5 Periodic Preventative Maintenance

To improve the efficiency and reliability of UPS, perform the following maintenance regularly.

- Clean UPS regularly by dry cloth. Don't use liquid or spray cleaner. Before cleaning, shut down UPS.
- Check if the wiring in the input and output are firmly and connect well.
- Check the working status of cooling fans regularly. Prevent sundries from blocking the air outlet. If any damage, please replace it in time.
- Check the battery voltage and the working status of UPS regularly.

4.6 Battery Maintenance

The working life of battery is based on environment temperature and discharge times. Using battery in the high temperature for a long time or discharging battery deeply will reduce the working life of battery.

- Charge battery for ten hours before using it. During charging, it can use the battery. If the battery and charger are powered off at the same time, the discharging time will be less than the standard value.
- Generally, charge and discharge battery once every four to six months. Discharge battery till the battery is under-voltage and power it off and then charge it. In the high temperature area, charge and discharge battery once every two months. The charging time for the standard battery should be more than ten hours every time.
- If UPS hasn't been used for a long time, it is recommended to charge battery more than ten hours every three months.
- Generally, the working life of battery is three to five years. If battery failure, replace it early. The battery replacement should be performed by authorized professional.

4.7 Troubleshooting

As shown in Table4-1, it only includes some common fault diagnosis.

If any doubt, contact the local office or distributor for details.

Table4-1 Troubleshooting

Fault phenomenon	Possible reason
The mains is normal. When starting UPS, it outputs normally. But it works in the battery mode and the buzzer beeps intermittently.	Check if the contacts in the input are with poor contact; Check if the input voltage amplitude or frequency of mains displayed in the LCD is beyond the allowable input range of UPS
After finishing installing UPS, connecting with power will fuse the fuse or cause power cut.	Output short circuit
When starting UPS, the LCD display and output are normal. But when connecting with load, it will stop outputting immediately.	UPS is overload seriously or the output circuit is short-circuit. It should reduce load to the proper capacity or find the short-circuit reason. The common reason is that the output changeover socket is short-circuit or the input is short-circuit after UPS failure. It doesn't follow the startup sequence that "high power device small power device" to start load. Restart UPS. When UPS works steadily, start high power device first, and start small power device successively.

Buzzer long beeps, fault indicator is on, UPS works in the bypass mode and inverter failure.	The output is overload. The load is too heavy, which is beyond the rated power of UPS. It should reduce load or select UPS with larger power capacity. It is normal that UPS works in the bypass mode temporarily for load startup impact and then recover automatically. UPS over-temperature protection. Check if the air inlet and air outlet of UPS is blocked or the working temperature of UPS is beyond the allowable range.
Usually, UPS works normally. When UPS powers off, it doesn't transfer to battery mode or it transfers to battery mode and battery has under-voltage protection soon.	Battery aging, battery capacity loss or it needs to replace battery. Battery charger fault. Usually, it can't charge battery. Battery wire doesn't connect well or the terminals are with poor contact.
When the load is PC, everything works normally. When power failure, UPS works normally, but the computer halts.	The grounding is unreliable for the floating voltage between the neutral wire and the grounding wire is too high.

5 Package, Transportation, Storage

5.1 Package

The package of product is carton. When packing, pay attention to the placing direction requirements. One side of carton, it should print warning icons, including keep dry, handle with care, up, stacking layer limit, etc. The other side of carton, it should print the device model, etc. Print device name on the front of carton.

5.2 Transportation

Pay attention to warnings on the carton. Don't impact it severely when transportation. In case of damaging device, it should follow the placing direction that shows on the carton. Don't carry device with the objects that inflammable, explosive, or corrosive. Don't put device in the open-air warehouse when transhipment. Leaching and mechanical damage by rain, snow or liquid objects is prohibited.

5.3 Storage

When storing device, it should follow the placing direction that shows on the carton. The gap is 20cm between the carton and ground and the clearance is at least 50cm from carton to wall, heat source, cold source, windows or air inlet.

The storage environment temperature is 0℃~40℃ and the relative humidity is 20%~80%. In warehouse, It's prohibited that there has poisonous gas, objects that inflammable and explosive, corrosive

chemical objects. Besides, it shouldn't have too strong mechanical shaking, impact and strong magnetic field. Under the storage conditions above, the storage period is six months. If it is beyond six months, it has to recheck. When long term storage ,it should charge battery every three months.

6 Technical Specifications

Index \ Model		10kVA
Input features	Voltage range (V)	220VAC, 50/60Hz When the voltage range is 176Vac~275Vac, UPS can be with full load. When the voltage range is 100Vac~176Vac, the load capacity is linearly derated from full load to 15% load according to the input voltage amplitude.
	Frequency range (Hz)	50/60±10% (50/60 self-adaption)
	Input method	Single phase three wire
	Battery voltage (V)	192 (default) (16/20 cell*12V settable)
	Charge current (A)	4 (default) (the selection range is 1-8A)
Output features	Power capacity (VA/W)	10000/9000
	Voltage (V)	220±2% (default) (120/208/220/230/240 settable)
	Frequency (Hz)	50/60±0.2% (battery mode)

	Wave	Sine-wave
	Voltage distortion	THD<1% (linear load); THD<5% (non-linear load)
	Power factor	0.9
	Transfer time (ms)	0
	Overload	105%＜Load≤130%:10mins,130%＜Load≤150%: 30s,>150%: 0.5s
Mechanical part	Dimensions (W×D×H) (mm)	250×660×720
	Weight (kg)	114.7
Other features	Backup time	1~15min (full load/ half load)
	Battery Backup Time	> 10 minutes at 1500 W load
	Charge recovery time	For standard model, the charge recovery time is less than 10 hour. For long backup model, the charge recovery time is determined by the capacity of external battery pack.
	Communication interface	RS232+EPO (standard)/RS485 (optional)/SNMP (optional)/USB (optional)
	Display	LCD displays the running status of UPS.

	Alarm function	Battery low-voltage, mains abnormal, UPS failure, output overload
	Protection function	Battery under-voltage protection, overload protection, short-circuit protection, over-temperature protection, input over-voltage protection
	Noise (dB)	<50
	Working temperature (℃)	-5 ~40
	Relative humidity	0 ~ 95%, non-condensation

UNINTERRUPTIBLE POWER SUPPLY 10 KVA

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